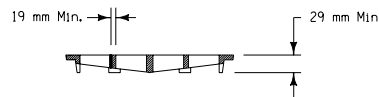
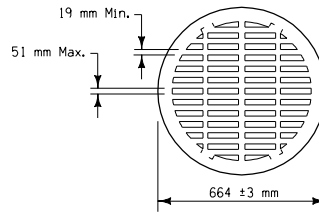


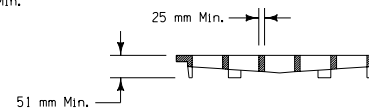
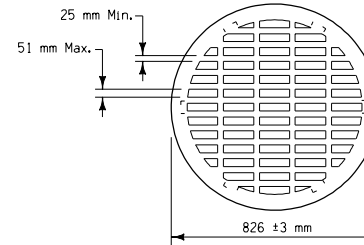
TYPE 4A GRATE ①

Minimum Mass = 29 kg



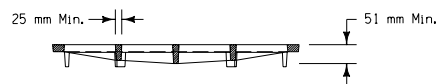
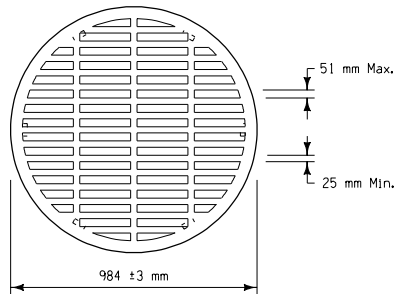
TYPE 4B GRATE ①

Minimum Mass = 45 kg



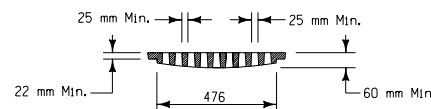
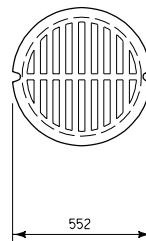
TYPE 4C GRATE ①

Minimum Mass = 73 kg



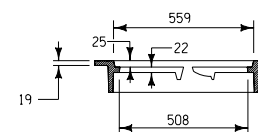
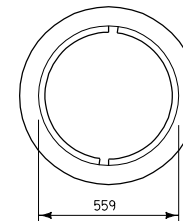
TYPE 4D GRATE ①

Minimum Mass = 109 kg



TYPE 9 GRATE ②

Minimum Mass = 39 kg



TYPE 9 FRAME

Minimum Mass = 34 kg

#### GENERAL NOTES:

All castings shall be Class 30 or better gray iron castings complying with the Standard and Supplemental Specifications and shall be essentially as detailed hereon. The castings illustrated hereon are typical only. Alternate designs for similar situations may be submitted to the Engineer for approval. Minimum mass requirements will be met unless authorization is received for any such deviation. All castings subject to roadway traffic shall have a machine ground bearing surface to prevent rattling, and match-marked before delivery. The use of grinding pads is allowed as long as all dimensional requirements are met.

Finish of castings shall be smooth and free of defects as per the Standard and Supplemental Specifications. Painting of casting is not required; however, if used, paint shall be evenly applied and neither sticky nor brittle when dry.

All component parts of casting shall fit smoothly together without forcing and the finished product shall have a completely satisfactory appearance.

An identifiable trade name or mark may be imprinted on castings by the casting foundry.

Unless specified otherwise as a part of detail plans, cast iron grates and frames described hereon shall not be paid for separately, but shall be included with and considered incidental to intakes or utility accesses.

- ① For Type 4 grates, a frame is required only when specified in detailed plans. Frames shall be of adequate and proper dimensions to satisfactorily accommodate the grates.
- ② Unless otherwise specified, Type 9 grate shall be cast without locking lugs so that it may be used in an inverted position when so desired.

#### TYPE 4 FRAME REQUIREMENTS

TYPE	D - PIPE DIAMETER	MIN. MASS
4A	450	23 kg
4B	600	36 kg
4C	750	57 kg
4D	900	91 kg

All dimensions given in millimeters unless noted.

<b>M</b>	<b>Iowa Department of Transportation</b>	
	<b>Project Development Division</b>	
	<b>STANDARD ROAD PLAN RA-66C</b>	
	REVISION: Revise dimensions on Type 9 Frame.	REVISION NO. 1
	APPROVED BY: DESIGN METHODS ENGINEER	REVISION DATE 02-11-00
<b>METRIC VERSION</b>	INTAKE GRATES TYPES 4A, 4B, 4C, AND 4D AND GRATE AND FRAME TYPE 9	